

# STM8L/STM32L

EnergyLite™ platform – Ultra-low-power devices

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# New MCU families – development focus



Flash size (bytes)

1 M

High performance and ultra-low power

- **STM32F (2.0 V – 3.6 V)**
- **STM32L ultra-low-power (1.65 V – 3.6 V)**

128 K

Standard voltage and  
ultra-low power

- **STM8S (2.95 to 5.5 V)**
- **STM8A (automotive)**
- **STM8L ( 1.65 to 3.6 V)**

16 K

Proprietary ST core

4 K

**Cortex™**

Intelligent Processors by ARM®

32-bit ARM Cortex™-M3 core

→ Features

# STM32L/STM8L – highlights

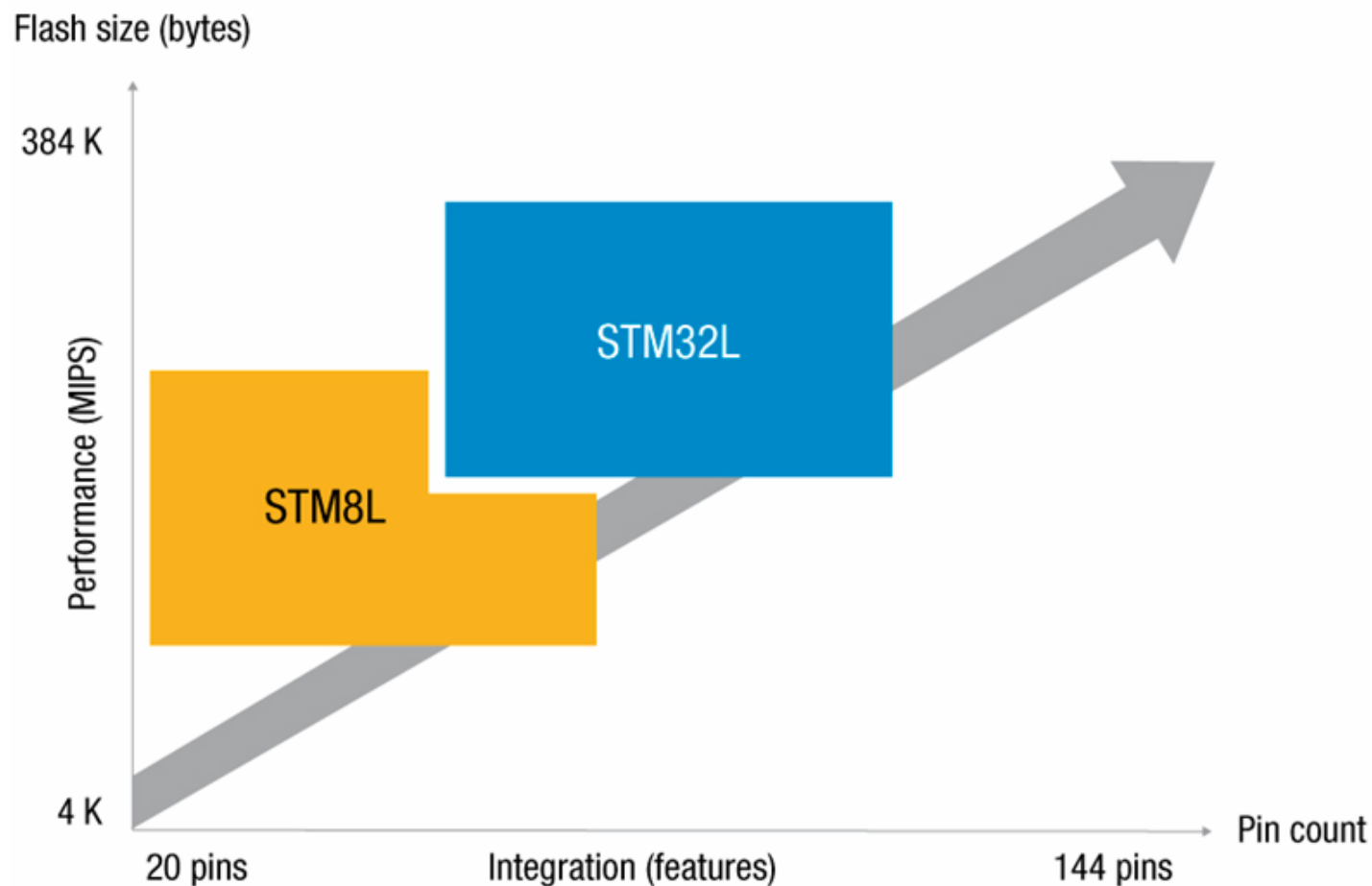


- Commitment to ultra-low power
  - EnergyLite™ platform for 8-bit (STM8L) and 32-bit (STM32L) MCUs
- Pure energy efficiency
  - High performance combined with ultra-low power gives high energy savings
- Ultra-low-power members of the STM32 and STM8 portfolios
  - Extend both the ultra-low-power EnergyLite platform and STM32/STM8 portfolio

# Ultra-low-power EnergyLite™ platform



- ST's 130 nm **ultra-low-leakage** process technology
- Shared technology, architecture and peripherals



# STM8L/32L – targeted applications



- Portable medical devices

- Metering



- Alarm systems

- General portable devices



- Factory automation



- Mobiles

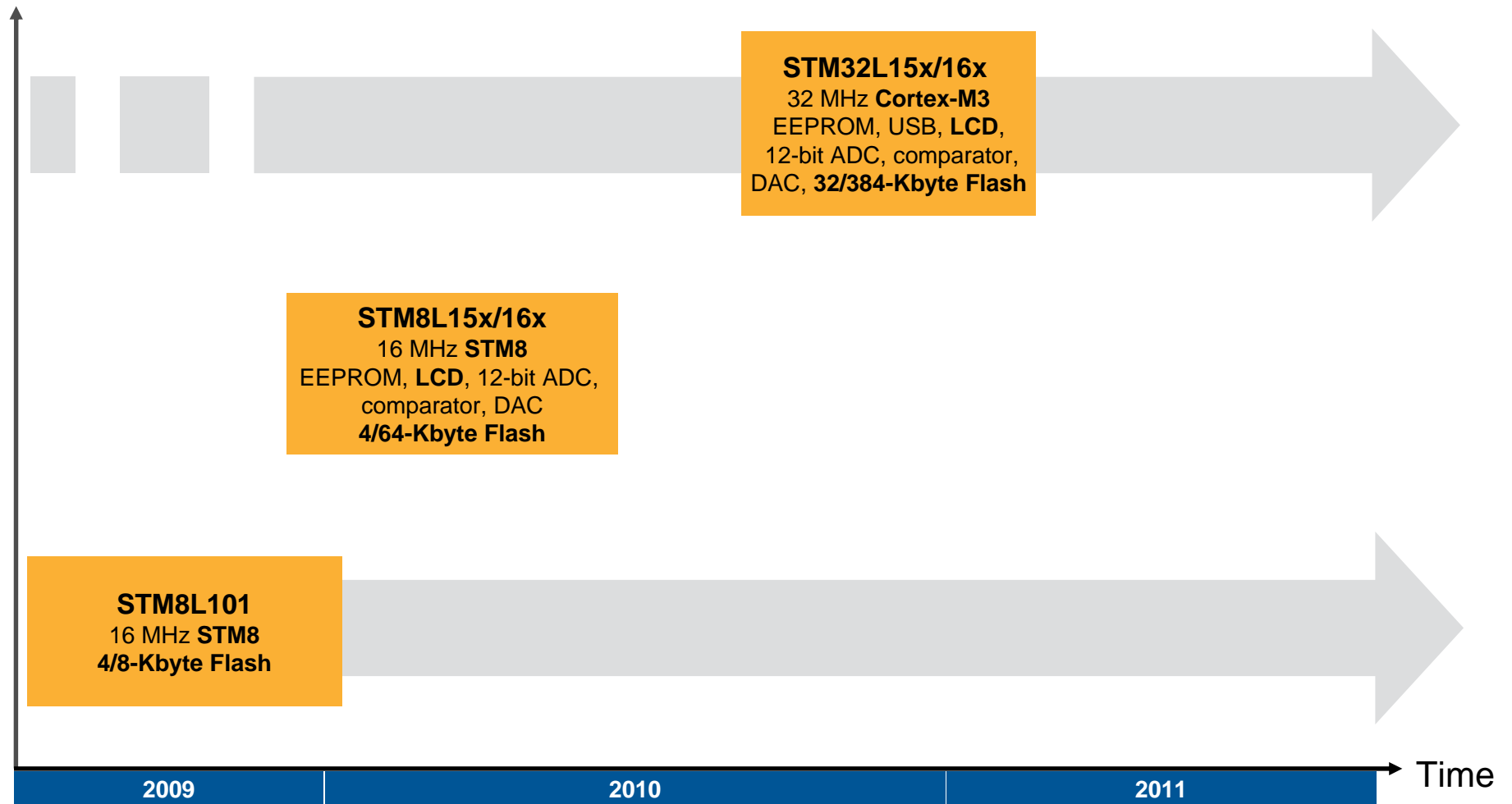
- Sensors



# Ultra-low-power portfolio



Performance and features



# EnergyLite L1 series – 3 lines



Common core peripherals and architecture:

Multiple communication peripherals USART, SPI, I <sup>2</sup> C
Multiple timers
Internal 16 MHz and 38 kHz RC oscillators
2x watchdogs
Reset circuitry POR/PDR
2x comparators

Feature rich 32-bit solution: STM32L151/152/162 line

ARM 32 MHz Cortex-M3 CPU	Up to 384- Kbyte Flash	Up to 48-Kbyte SRAM	BOR PVD	Main osc. input 1-24 MHz	Data EEPROM	RTC with 32 kHz osc.	DMA	12-bit ADC (1 μs) Temp. sensor	2x 12- bit DAC	LCD 8x40	AES 128- bit	ULP MSI	MPU ETM	USB FS	SDIO	FSMC
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Feature rich 8-bit solution: STM8L151/152/162 line

STM8 core @ 16 MHz	Up to 64- Kbyte Flash	Up to 4-Kbyte SRAM	BOR PVD	Main osc. input 1-16 MHz	Data EEPROM	RTC with 32 kHz osc.	DMA	12-bit ADC (1 μs) Temp. sensor	12- bit DAC	LCD 8x40	AES 128- bit
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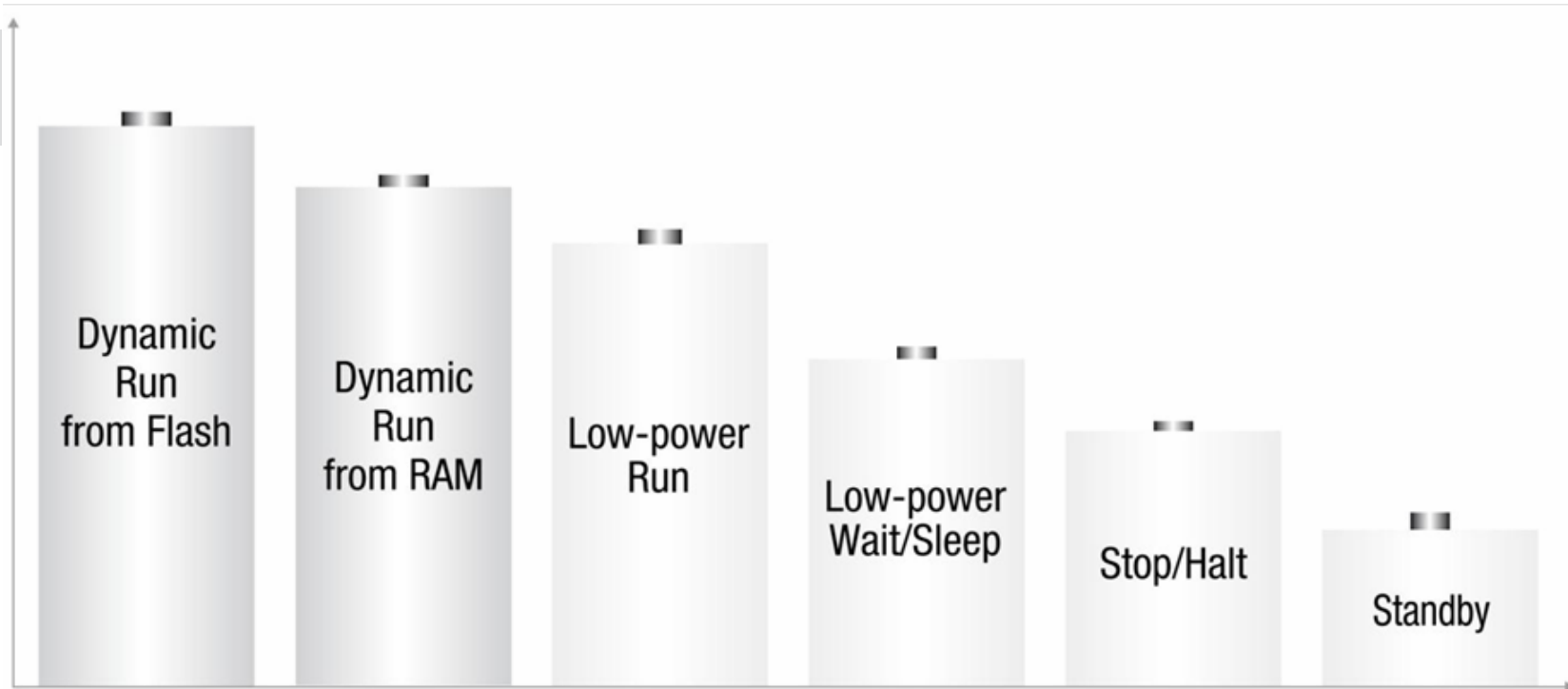
Entry level 8-bit solution: STM8L101 line

STM8 core @ 16 MHz	Up to 8- Kbyte Flash	Up to 1.5-Kbyte SRAM
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# STM32L/STM8L – ultra-low-power modes



- Fast wake-up
- Reset active



# Ultra-low-power architecture



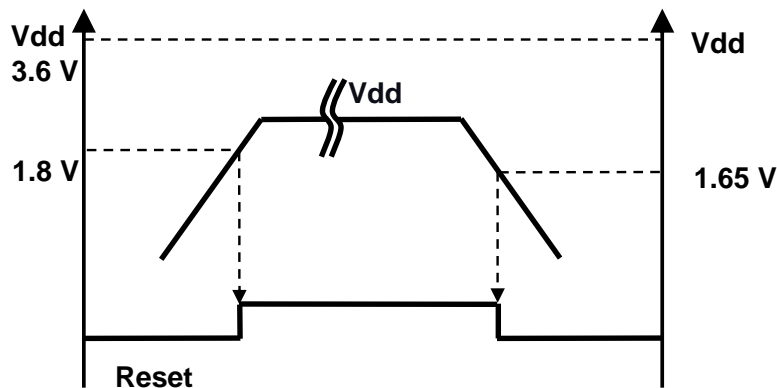
## Ultra-low-power IPs

IP	Consumption
POR	Included
BOR+PVD	2.6 $\mu$ A
IWDG	50 nA
RTC	350 nA
LSE	450 nA/1.8 V
I/O leakage	50 nA

Automatic clock gating  
Off option for Flash  
Fast start-up

*decreasing power consumption*

## Ultra-low voltage



### Power supply

- Down to 1.8 V with BOR
- Down to 1.65 V w/o BOR

### Analog functional

Down to 1.8 V

### Reprogramming capability

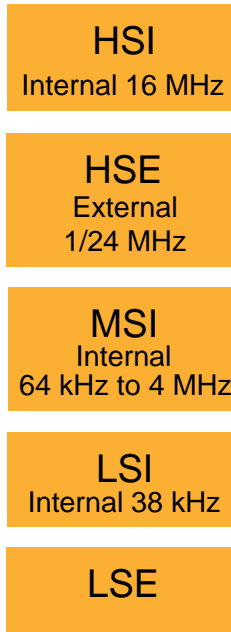
Down to 1.65 V

# STM32L/STM8L – flexible and secure



## Flexible clock system

### Multiple sources



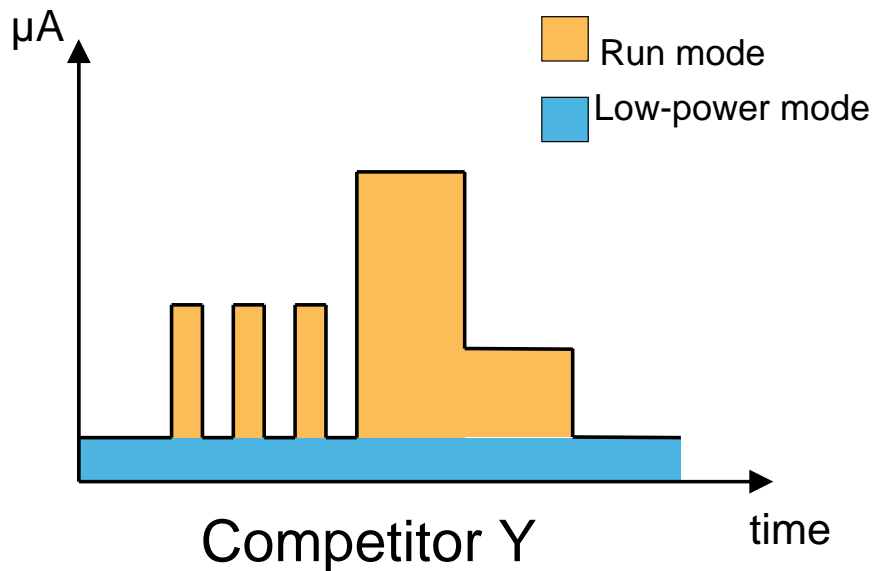
- 0.5 % internal clock accuracy when trimmed by RTC oscillator
- Up to 5 clock sources
- MSI (STM32L only) to achieve very low power consumption at 7 low frequencies
  - 1  $\mu$ A @ 64 kHz
  - 20  $\mu$ A @ 4 MHz

## Security and safety

- Memory protection unit
- Reset circuitry
- CRC 32-bit
- Back-up clock
- Back-up register
- Flash protection
- NV memories with ECC
- Anti tamper
- Dual watchdog
- Unique ID
- I/O locking
- Supply monitoring
- Dual stack pointer
- JTAG fuse

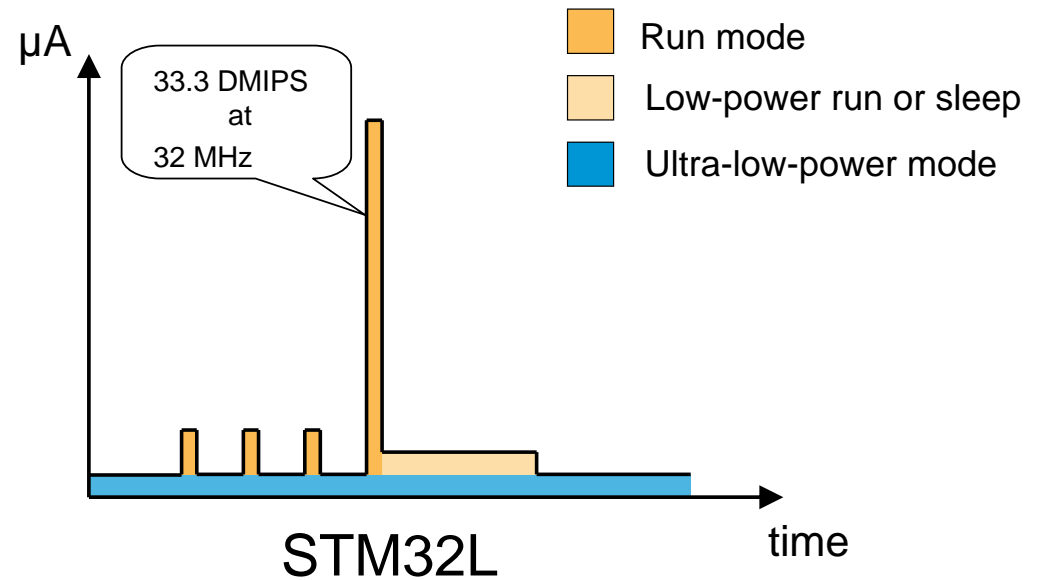


# Save energy too!



- Low-power mode ( $\mu\text{A}$ )
- Medium performance (DMIPS)

> 443  $\mu\text{A}/\text{DMIPS}$   
in run mode



- Ultra-low-power static modes ( $\mu\text{A}$ )
- Optimized dynamic modes ( $\mu\text{A}$ )
- High performance (DMIPS)
  - Energy saving ( $\mu\text{A}/\text{DMIPS}$ )

Down to 185  $\mu\text{A}/\text{DMIPS}$   
in run mode (STM32L)

# STM32L/STM8L ultra-low-power



- With the EnergyLite™ platform, STMicroelectronics is strongly committed to ultra-low-power MCUs

- Energy saving

- Ultra-low-power advanced architecture
- High-performance core
- Ultra-low power in dynamic and static modes



- New STM32L/STM8L series increase STM32/STM8 offer
  - Enrich both the ultra-low-power EnergyLite™ platform and STM32/STM8 portfolio
  - More than 100 part numbers for ultra-low-power lines

# Thank you



[www.st.com/stm32l](http://www.st.com/stm32l)

[www.st.com/stm8l](http://www.st.com/stm8l)